



Chapter 9

TAKING CARE OF WOUNDS

KEY FIGURE:

Gauze

Wound care represents a major area of concern for the rural health provider. This chapter discusses the treatment of open wounds, with emphasis on dressing techniques. These techniques can apply to an acute wound allowed to heal on its own (see chapter 10) or to a chronic/longstanding wound.

Definitions

Cellulitis: diffuse infection of the soft tissues.

Clean wound: a wound in the process of healing; usually it has a bed of healthy granulation tissue (see below) without overlying exudate or surrounding cellulitis.

Debridement: the process of removing dead/unhealthy tissue from a wound.

Dirty wounds: wounds covered with exudate or eschar (scab), but not infected.

Exudate: the tan/grayish material that often forms over an open wound. It consists of proteinaceous material from the wound itself. The presence of exudate does not mean that the wound is infected.

Granulation tissue: the red, shiny tissue that forms at the base of an open wound during the healing process. It is composed of inflammatory cells necessary for wound healing, and bacteria. Granulation tissue is highly vascular and bleeds easily. For this reason, a wound covered with granulation tissue frequently bleeds with dressing changes or minor trauma.

Infected wounds: wounds caused by injury with a dirty source (such as a rusted metal object) or associated with dirt/grass contamination.

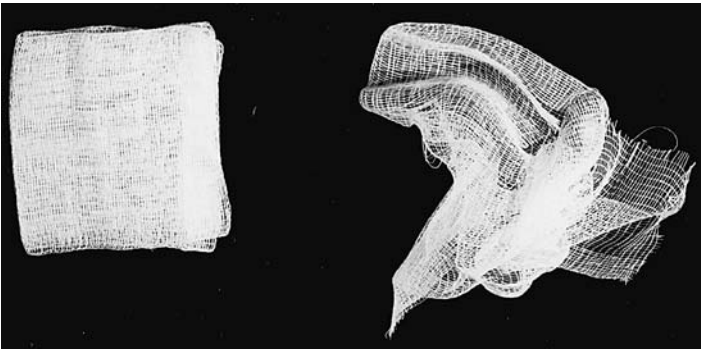
A chronic wound, covered with necrotic (dead) material and surrounded by cellulitis, also is described as an infected wound.

Supplies

The following supplies are basic for taking care of a wound.

Newly Developed Materials

Currently, in affluent areas of the world, hydrocolloid-type dressings and growth factor formulations aid in the wound-healing process. However, these products are quite expensive and not readily available. As of yet, they do not necessarily yield the superior results that warrant the added expense. For these reasons, hydrocolloid-type dressings and growth factor formulations are not discussed.



Gauze usually comes folded into a square. For dressings, it is best to open the gauze so that a single layer is in contact with the open wound.

Dressing Materials

The best material to use for dressings is plain cotton gauze. Usually, all that is needed is just enough gauze to cover the wound lightly; multiple layers are unnecessary and wasteful.

There is nothing sterile about your skin or an open wound. Bacteria colonize the surface of both. For this reason, you do not have to use sterile technique to change dressings. Clean technique is usually sufficient.

Sterile Technique vs. Clean Technique

Sterile technique uses instruments and supplies that have been specifically treated so that *no* bacterial or viral particles are present on their surfaces. Examples of sterilized supplies include instruments that have

been autoclaved (subjected to high temperatures to kill microorganisms) and gauze and gloves that have been especially prepared at the factory and are individually packaged. Procedures in an operating room are usually done with sterile technique.

Clean technique uses instruments and supplies that are not as thoroughly treated to rid surfaces of all microorganisms. Nonsterile gloves and gauze, which come many in a package, are examples of “clean” supplies. Clean supplies are less expensive than sterile supplies. Hence, appropriate use of clean techniques can save valuable resources.

The occasions when a sterile dressing should be used are noted throughout the text.

Solutions

Various solutions are available for wound care. They are poured onto the gauze, and then the moistened gauze is placed over the wound. They also can be used to cleanse the wound. The following table describes commonly used solutions.

Table 1. Solutions for Dressings

Solution	Preparation	Usage	Notes
Betadine	Purchased premade in container Best diluted for dressings: 1 part Betadine to at least 3 or 4 parts saline or sterile water	To clean wounds, to use for dressings Especially good for infected wounds	Toxic to healthy tissues; best used in diluted form for few days at time. Then use another solution for dressings. Safe on face and around eyes.
Saline*	To 1 liter of water add 1 tsp salt Boil solution for at least 60 sec Cool before use Essentially equivalent to and cheaper than prepackaged liter of saline solution	To clean wounds, to use for dressings	Safe anywhere on body
Sterile water*	Boil 1 liter of water for at least 60 sec Cool before use	To clean wounds	Safe anywhere on body
Dakin's solution*	To 1 liter of saline solution add 1–2 tsp (5–10 cc) liquid bleach Some pharmacies keep Dakin's solution in stock When available, best diluted: 1 part Dakin's to 3–4 parts saline or sterile water	To use for dressings	Better antibacterial agent than saline Do not use around eyes

* Keep the solution in a sealed container; refrigerate if possible. Solutions stay fresh for several days.

Useful Antibiotic Ointments

Some wounds (e.g., burn) are best treated with antibiotic ointments. The antibiotic is absorbed into the tissues of the wound to prevent infection. The ointment keeps the wound moist and helps to decrease the pain caused by a wound that has become too dry.

Table 2. Examples of Antibiotic Ointments and Their Uses

Ointment	Indication	Comments
Silver sulfadiazine (Silvadene)	Burns	Do not use around eyes
Bacitracin	Open wounds, face burns	Do not use around eyes*
Triple antibiotic	Open wounds, face burns	Do not use around eyes

* Use only a topical antibiotic ointment specifically labeled for ophthalmologic use around the eyes. Bacitracin has an ophthalmologic formulation, as do garamycin and erythromycin ointments.

Types of Dressing Techniques

The following dressing techniques are easy to do and require the least amount of materials. Unless otherwise noted, clean technique is sufficient. Pain medication is sometimes needed to make the dressing change process more tolerable for the patient. Usually, an oral agent can be used; it is best to administer it 30 minutes before the dressing change.

Note: At least once a day, usually at the time of a dressing change, the wound should be cleaned with gentle soap and water or washed with saline.

Wet-to-Dry

Indication

The objective of the wet-to-dry dressing technique is to clean a wound or to prevent build-up of exudate. It is called a “wet-to-dry” dressing because you place a moist dressing on the wound and allow it to dry. When the dressing is removed, it takes with it the exudate, debris, and nonviable tissue that have become stuck to the gauze. Wet-to-dry dressings are indicated for wounds that are dirty or infected.

Technique

Moisten a gauze dressing with solution, and squeeze out the excess fluid. The gauze should be damp, not soaking wet. Completely open the gauze (it usually comes folded), and place it on the wound. You do *not* need many layers. Then cover with a thin layer of dry gauze.

When changing the dressing, pour a few milliliters of saline (or water) on the bottom layer of gauze if it has completely dried out. This technique prevents the removal of healthy new tissue from the surface of the wound. Remove the dressing gently to avoid causing pain.

How Often?

Optimally, a wet-to-dry dressing should be changed 3–4 times/day, depending on how much debridement is needed. The dressing should be changed more frequently for a dirty wound than for a clean wound. However, depending on the availability of dressing material and personnel, the dressings may be changed less often. Gradually the wound will become cleaner and heal.

Wet-to-Wet

Indication

A wet-to-wet dressing does not debride the wound, which remains as it is. The dressing remains wet so that when the gauze is removed, the top layers of the healing wound are not removed with it. This dressing should be used on clean, granulating wounds with no overlying exudate in need of removal.

Technique

Moisten the gauze dressing with solution. It should not be soaking wet, but it should be a little wetter than damp. Unfold the gauze, place it over the wound, and then cover with dry gauze. The dressing should still be wet or damp when it is changed. If the bottom layer of gauze has dried out, saturate the gauze with saline or water before removal.

How Often?

The wet-to-wet dressing should be changed at least twice a day to prevent drying.

Antibiotic Ointment

Indication

Antibiotic ointment may be used as an alternative to wet-to-wet dressings for a clean wound that is healing well and has no need for debridement.

Technique

Coat the wound with a small amount of ointment. A thick layer of antibiotic ointment over the wound offers no advantage and wastes supplies. Cover with a dry gauze if the wound is large or if it is in an area that will be covered with bedclothing or rubbed by clothing. Otherwise the wound can be left open to air with the antibiotic ointment alone.

How Often?

Remove the old ointment with gentle soap and water or saline, and reapply the ointment once or twice a day.

When to Use Which Dressing

- For wounds that are infected or covered with exudate, use a wet-to-dry dressing.
- For uninfected wounds that are in the process of healing and have no need of debridement, use a wet-to-wet dressing or antibiotic ointment. You may use a wet-to-dry dressing, but it may cause more pain than the other two options.

Bibliography

1. Ladin DA: Understanding dressings. *Clin Plast Surg* 25:433–441, 1998.
2. Steed D: Modifying the wound healing response with exogenous growth factors. *Clin Plast Surg* 25:397–405, 1998.